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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
DO, ANH HONG	
ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/448,940	BARNES ET AL.	
	Examiner	**Art Unit**	
	ANH H DO	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 November 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 11/01/2004 have been fully considered but they are not persuasive.

* With respect to the applicant's argument that the cited prior art teaches only lossy compression, not lossless, it should be noted that although Balkanski does not explicitly teach the lossless compression process, Konstantinides cures the deficiency by teaching this process. Specifically, on page 4, lines 43-45, the prior art teaches a compression process using run-length encoding which is a **lossless**, entropy coding using the Huffman tables 22 in the entropy encoder 20 (see Fig. 2).

Furthermore, the applicant also contends that the cited references fail to teach "applying the compression code tables to uncompressed image data". In contrast, Balkanski clearly teaches coder unit 111a using Huffman code tables 117 for translating the zero-packed data into Huffman codes wherein the zero-packed data is uncompressed image data (see col. 10, lines 36-38).

For the foregoing reasons, it is believed that the rejection should be sustained.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

> invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Balkanski et al. (U.S. Patent No. 5,936,616) in view of Konstantinides et al. (EP 0974933).

Regarding claim 1, Balkanski discloses:

- compiling and storing a plurality of compression mapping tables for converting uncompressed data representative of individual picture elements to compressed data (col. 10, lines 13-16, teaches the Huffman code tables 117 for compiling and storing a plurality of Huffman code tables; and col. 10, lines 36-38, teaches Huffman tables are used to convert uncompressed data into compressed data);

- applying at least first and second compression mapping tables from the stored plurality of compression mapping tables to subregions of an uncompressed image data stream to compress the subregions (col. 10, lines 36-38, teaches applying the Huffman code tables from the stored Huffman code tables 117 to uncompressed image data, wherein the uncompressed image data is stored into single component data blocks (i.e., the subregions) as disclosed in col. 28, lines 1-4);

- appending data for the compressed subregions to form a compressed image data stream (col. 25, lines 11-18, teaches a bit-concatenation module 512 for appending data for the Huffman code (i.e., the compressed subregions) to form a coded bit stream).

Balkanski does not disclose expressly teach lossless compression.

Konstantinides discloses entropy encoder 20 using Huffman tables 22 for converting uncompressed image data representative of individual picture elements from quantizer 18 into lossless compressed image data (see Fig. 2).

Balkanski & Konstantinides are combinable because they are from image compression field.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to employ lossless entropy encoder taught by Konstantinides in Balkanski.

The suggestion/motivation for doing so would have been to achieve high compression ratios and still maintain a high image quality (Balkanski, col. 2, lines 60-62).

Therefore, it would have been obvious to combine Balkanski with Konstantinides to obtain the invention as specified in claim 1.

Regarding claim 2-4, Balkanski teaches using compression code tables to map a prediction error generated by DPCM MOD 511 for each pixel to compressed data code (col. 24, lines 46-68).

Regarding claims 5-7, Balkanski teaches compression code tables are selected based on the entropy level of each pixel block (col. 24, lines 13-15).

Regarding claim 12, Balkanski discloses:

- defining a family of compression code tables for converting uncompressed image data to compressed data (col. 10, lines 13-16, teaches defining a family of Huffman code tables; and col. 10, lines 36-38, teaches Huffman tables are used to convert uncompressed data into compressed data);

- storing the compression code tables in an image compression station and in an image data decompression station (col. 10, lines 13-18);

- selecting at least two of the compression code tables for compression of subregions of an image data stream (col. 24, lines 10-15, teaches selecting two Huffman tables);

- compressing the image data stream in accordance with the selected compression code tables at the compression station for decompression at the decompression station (col. 29, lines 30-37, teaches coding means for compressing the image data stream in accordance with the selected compression code tables at the compression station for decompression at the decompression station).

Balkanski does not disclose expressly teach lossless compression.

Konstantinides discloses entropy encoder 20 using Huffman tables 22 for converting uncompressed image data representative of individual picture elements from quantizer 18 into lossless compressed image data (see Fig. 2).

Balkanski & Konstantinides are combinable because they are from image compression field.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to employ lossless entropy encoder taught by Konstantinides in Balkanski.

The suggestion/motivation for doing so would have been to achieve high compression ratios and still maintain a high image quality (Balkanski, col. 2, lines 60-62).

Therefore, it would have been obvious to combine Balkanski with Konstantinides to obtain the invention as specified in claim 12.

Regarding claims 18 and 19, Balkanski discloses:

- a data compression station configured to store a plurality of compression code tables or conversion of image data to compressed image data (col. 10, lines 13-16, teaches the Huffman code tables 117 for storing a plurality of Huffman code tables; and col. 10, lines 36-38, teaches Huffman tables are used to convert uncompressed data into compressed data), and to execute a compression routine in which an image data stream is converted to compressed file by dividing into subregions and each region compressing in accordance with a compression code table selected from the plurality of compression code tables based upon which compression code tables provides optimal compression of the subregion (col. 28, lines 1-4, teaches the uncompressed image data is sorted into single component data blocks (i.e., the subregions), and col. 10, lines 36-38, teaches the Huffman code table selected from the stored Huffman code tables 117 compressing the uncompressed image data to provide optimal compression of subregions);

- a data storage device for receiving and storing the compressed file (col. 10, lines 38-41, teaches a mass storage media for receiving and storing the coded data file);

- an image decompression station configured to store the plurality of compression code tables, to access the compressed file from the data storage device, and to execute a decompression routine in which the compression code tables applied

to compress the image stream are applied to decompress the compressed file to reconstruct the image data stream (col. 10, lines 13-18, teaches an image decompression station configured to store the plurality of compression code tables, and Fig. 1: decoder 111b for decompressing the compressed file to reconstruct the image data stream using the same Huffman tables as those in the compression station).

Balkanski does not disclose expressly teach lossless compression.

Konstantinides discloses entropy encoder 20 using Huffman tables 22 for converting uncompressed image data representative of individual picture elements from quantizer 18 into lossless compressed image data (see Fig. 2).

Balkanski & Konstantinides are combinable because they are from image compression field.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to employ lossless entropy encoder taught by Konstantinides in Balkanski.

The suggestion/motivation for doing so would have been to achieve high compression ratios and still maintain a high image quality (Balkanski, col. 2, lines 60-62).

Therefore, it would have been obvious to combine Balkanski with Konstantinides to obtain the invention as specified in claim 18.

Regarding claim 24, Balkanski teaches:

- a machine readable medium (col. 5, lines 45-49, teaches a computer implicitly including a machine readable medium);

- configuration code stored in the machine readable medium, the configuration

code including an algorithm for analyzing an image data stream (col. 5, lines 38-45), for compressing subregions of image data stream by application of a plurality of compression code tables (col. 10, lines 36-38, teaches applying the Huffman code tables from the stored Huffman code tables 117 to uncompressed image data, wherein the uncompressed image data is stored into single component data blocks (i.e., the subregions) as disclosed in col. 28, lines 1-4), and for compiling the compressed subregions into a compressed data file (col. 25, lines 11-18).

Balkanski does not disclose expressly teach lossless compression.

Konstantinides discloses entropy encoder 20 using Huffman tables 22 for converting uncompressed image data representative of individual picture elements from quantizer 18 into lossless compressed image data (see Fig. 2).

Balkanski & Konstantinides are combinable because they are from image compression field.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to employ lossless entropy encoder taught by Konstantinides in Balkanski.

The suggestion/motivation for doing so would have been to achieve high compression ratios and still maintain a high image quality (Balkanski, col. 2, lines 60-62).

Therefore, it would have been obvious to combine Balkanski with Konstantinides to obtain the invention as specified in claim 24.

Regarding claims 9, 16, and 26, Balkanski teaches computation of the

compressed data lengths and selecting the compression code tables providing the shortest compressed data lengths for each subregion (col. 24, lines 56-68).

Regarding claims 14 and 20-22, Balkanski teaches analysis of the image data stream for data representative of an identification of an image encoded by the image data stream (col. 6, lines 1-4, teaches VBIU 102 analyzing the stored video sequence in the external buffer memory for addresses identifying 8 x 8 pixel blocks).

Regarding claims 10 and 17, Balkanski teaches the number of compression mapping tables may be encoded with at most two bits of data (col. 24, lines 11-15).

Regarding claims 11, 13 and 23, Balkanski teaches encoding of identifiers of the selected code tables within the compressed file (col. 6, lines 52-54, teaches compressing a group of 64 pixels, expressed as an 8 x 8 matrix) and analysis of the identifiers for selection of the same compression code tables for decompression of the compressed file (Fig. 1: decoder 111b for decompressing the compressed file to reconstruct the image data stream using the same Huffman tables as those in the compression station).

Regarding claims 8 and 15, Balkanski teaches application of DPCM MOD 511 for determining a difference between a predicted pixel value and an actual pixel value and wherein the compression code tables are applied to encode the difference values (Fig. 6a(1) and col. 24, lines 46-68).

Regarding claim 25, Balkanski teaches storing a family of candidate compression code tables on the machine readable medium (Fig. 1: 117).

Regarding claim 27, Balkanski teaches the code is installed on the machine

readable medium via a configuration network link (col. 5, lines 45-55).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANH H DO whose telephone number is 571-272-7433. The examiner can normally be reached on 5/4-9.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, DAVID K MOORE can be reached on 571-272-7437. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

April 18, 2005

ANH HONG DO
PRIMARY EXAMINER